KDY 9485
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: William R. Kennedy, et al. Art Unit: 3637
Serial No.: 10/003,353
Filed: November 1, 2001
Confirmation No.: 5231
For: MINE DOOR LEAF AND METHOD OF MANUFACTURE THEREOF
Examiner: Phi Dieu Tran A

February 25, 2005

BRIEF FOR APPELLANT

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BRIEF FOR APPELLANTS

This is an appeal from the final rejection of the claims of the above-identified application made in the Office action mailed December 22, 2004. This Brief for Appellants is being filed simultaneously with a Notice of Appeal.

I. Real Party in Interest

The real party in interest in the present appeal is Jack Kennedy Metal Products and Buildings, Inc. of Taylorville, Illinois, a corporation of the State of Delaware, owner of a 100 percent interest in the pending application.

II. Related Appeals and Interferences

Appellants, appellants' legal representative and the assignee are unaware of any other appeals or interferences which are related to, which would directly affect, which would be directly affected by, or which would have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-9, 14, and 31-45 are pending in the application and stand rejected. The rejection of claims 1-9, 14, and 31-45 is being appealed. The claims on appeal (1-9, 14, and 31-45) are set forth in full in Appendix A to this Brief.

IV. Status of Amendments

No amendments have been filed subsequent to the final rejection.

V. Summary of Claimed Subject Matter

The following summary is provided in accordance with M.P.E.P. §1206 and correlates claim elements to specific embodiments described in the application specification. Consistent with M.P.E.P. §1206, the following summary does not in any manner limit claim interpretation. Rather, the following summary is provided only to facilitate the Board's understanding of the subject matter of this appeal.

Claim 1 is directed generally to a mine door leaf 5L (or 5R) of generally laminar construction mounted for swinging between open and closed positions in a doorway in a mine passage (page 3, lines 2-8, page 5, lines 1-4, page 7, lines 25-29, Figs. 1-3). The mine door leaf 5L comprises a central core 33 of a solidified composition and outer panels 21, 23 on opposite faces of the core (page 5, lines 9-12, Figs. 2, 3). The core 33 has a force-transmitting relationship with the panels 21, 23 constituting the panels and core as an integral stress-resistant structure resistant to stresses to which the door leaf 5L is subjected in a mine, including torsion-induced stresses, shear and bending stresses, and stresses induced by its own weight (page 5, lines 11-15, page 7, lines 16-22, Figs. 2, 3). The mine door leaf 5L also comprises one or more hinge components 27, 29 on the leaf (page 5, lines 1-5, Fig. 1).

Claim 38 is directed generally to a mine door installation 1 in a mine passageway of a mine comprising a doorway frame 3 in the mine passage (page 3, lines 1-5, Fig. 1). The doorway frame 3 comprises a column 59 yieldable to accommodate mine convergence without permanent deformation of the doorway frame (page 3, lines 11-18, Fig. 1). A door leaf 5L (or 5R) is mounted on the doorway frame 3 for swinging between open and closed positions (page 5,

lines 1-4, Fig. 1). The door leaf 5L, 5R has a generally laminar construction comprising a central core 33 of a solidified composition and outer panels 21, 23 on opposite faces of the core (page 5, lines 9-12, Figs. 2, 3). The core 33 has a force-transmitting relationship with the panels 21, 23 constituting the panels and core as an integral stress-resistant structure resistant to stresses to which the door leaf 5L is subjected in the mine, including torsion-induced stresses, shear and bending stresses, and stresses induced by its own weight (page 5, lines 11-15, page 7, lines 16-22, Figs. 2, 3).

Claim 41 is directed generally to a mine door installation 1 in a mine passageway of a mine comprising a doorway frame 3 in the mine passage (page 3, lines 1-5, Fig. 1). A door 5 is mounted on the doorway frame 3 for swinging between open and closed positions (page 5, lines 1-4, Fig. 1). The door 5 includes at least one door leaf 5L (or 5R) (page 3, lines 5-7, Fig. 1). The door leaf 5L comprises a central core 33 of a solidified composition and outer panels 21, 23 on opposite faces of the core (page 5, lines 9-12, Figs. 2, 3). The door leaf 5L has at least four edges 9, 11, 13, 15 (page 3, lines 20-22, Fig. 1). The frame 3 directly supports two of the edges 9, 13 when the door is in the closed position and another two of the edges 11, 15 are substantially free of direct support (page 5, lines 1-8, Fig. 1).

VI. Grounds of Rejection to be Reviewed on Appeal

1. Claims 1-9, 14, and 31-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Re 36,853 (Kennedy) in view of U.S. Patent No. 6,481,179 (Zen).

VII. Argument

1. Claims 1-9, 14, and 31-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Re 36,853 (Kennedy) in view of U.S. Patent No. 6,481,179 (Zen).

A. Claims 1, 3-6, 8, 9, 14, 31, 32, and 35

Claim 1 is directed to a mine door leaf mounted in a mine passage and comprising:

a) a central core of a solidified composition,

b) outer panels on opposite faces of the core,

c) **the core having a force-transmitting relationship with the panels constituting the panels and core as an integral stress-resistant structure resistant to stresses to which the door leaf is subjected in a mine**, including torsion-induced stresses, shear and bending stresses, and stresses induced by its own weight, and

d) one or more hinge components on the leaf.

Applicants' mine door, as defined by claim 1, is designed to be both strong and lightweight. Strength is needed so that the mine door can withstand the substantial air pressure forces exerted on a door in a mine. For example, the ventilating air in a mine creates substantial air pressure differentials across a closed door, one side of the door being at a relatively higher pressure and the other side at a relatively lower pressure. This differential creates substantial stresses in the door. Also, a mine door is subjected to concussive air forces resulting from intentional or unintentional roof collapses and explosions in the mine during the mining process. Concussion is not simply a single pressure from an expansion of gases or the movement of rock. As an explosion occurs at the mine face, for instance, the pressure is raised locally by the expansion of the explosive gases. Initially there is a shock wave followed by movement of

air away from the site of the explosion. This movement creates a vacuum at the site of the explosion, which eventually causes the air to reverse direction toward the center of the explosion. This expansion and contraction of the air repeats in decaying cycles and subjects a mine door to repetitive push and pull forces. If the door is not resistant to such forces, it will fail.

In addition, mine doors are typically mounted in cantilevered fashion, leaving each door leaf unsupported along its free vertical edge (except where it contacts the lintel of the doorway frame) and along its lower edge (except where it is attached to the doorway frame), as shown in Fig. 10 of the pending application, for example. As a result, a mine door leaf is subjected to torsional forces and is prone to flex if not rigidly constructed. Flexing must be avoided, since this can lead to failure of the door, or at least deformation at the unsupported side of the door sufficient to cause substantial leakage past the door. Such leakage can have adverse consequences in terms of increased costs and ventilation problems. Structural strength and rigidity is also important so that the door can withstand the substantial forces required to open and close the door due to the air pressure differentials discussed above, and further to withstand the substantial abuse a door takes in a mine from passing equipment and personnel.

A lightweight door is also important for several reasons. First, a heavy door includes extra materials and therefore is more expensive. Second, a heavy door has more inertia than a lighter door, thus requiring greater opening and closing forces. Heavy doors are harder to stop when moving, which can create risks to people and equipment around the door. Third, a heavy door is more difficult to transport, handle, and install. Fourth, a lighter door greatly reduces the load on the hinges, frame, and adjacent structure. Heavy mine doors tend to cause hinge failure and undesired movement of the frame and structure.

Applicants' door is economical, strong, and lightweight, which provide a substantial advantage in the field of mine doors.

Claim 1 is submitted to be patentable over U.S. Patent No. Re 36,853 (Kennedy) in view of U.S. Patent No. 6,481,179 (Zen) in that there is no suggestion or motivation for one of ordinary skill in the art to combine Zen with Kennedy.

Kennedy discloses a mine door system 21 having a door frame 23, a mine door 27, 29 hingedly mounted on the door frame, and a column 43 contractible heightwise without loss of structural integrity to accommodate a convergence of the ceiling 26 or floor 24 of the passageway P without any substantial deformation of the door frame.[1] As conceded in the rejection, Kennedy fails to disclose a mine door comprising outer panels and a central core of a solidified composition.[2] Moreover, Kennedy fails to suggest such a door.

As shown in Figs. 1 and 2, Zen discloses a frame 2 for a steel clad door comprising a pair of jamb members 5, a header 6 and a sill 7 molded from a composite material.[3] Each of the frame members 5, 6, 7 is channel shaped having a bottom wall 8, 17, 18 and two sidewalls 9, 19, 20.[4] In addition, the jambs have reinforcing diagonal members 12 extending between their sidewalls 9 and longitudinal grooves 21 in the exterior face of the bottom walls 8 for receiving inturned edges 22 of steel cladding panels 3 thereby attaching the panels 3 to the frame 2.[5] Once the

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[1] U.S. Patent Re. 36,853, column 2, lines 27-34, column 6, lines 24-35, Figs. 1 and 3.

[2] Final Office Action dated December 22, 2004, page 2, paragraph 2.

[3] U.S. Patent No. 6,481,179, column 3, lines 9-12.

[4] *Id.* at column 2, lines 28-31, 44-47.

[5] *Id.* at column 2, lines 32-39, 58-61.

panels 3 are mated with the frame 2, the interior can be filled with insulation 4, such as polyurethane.[6] Insulation is a material that retards the passage of heat, electricity, or sound.[7] Zen does not teach or suggest that the insulation strengthens the door.[8] It is apparent from Zen that the strength of the door is created by the frame 2, not the insulation 4.

The rejection fails to provide sufficient evidence to support the position that there is motivation or suggestion to combine Kennedy and Zen. The Examiner has taken the position that it would have been obvious to one skilled in the art to combine Kennedy and Zen since "it has been held to be within the skill of a worker in the art to select these well known light weight and strong panels to provide the strength and durability of steel at a very low cost as an obvious matter of engineering design choice."[9] Also, "[i]n this case, the motivation to do so is found in the knowledge generally available to one of ordinary skill in the art."[10]

However, the Examiner fails to provide any reference or other evidence that supports his position. "It is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection is based."[11] In *In re Zurko*, the Federal

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[6] *Id.* at column 2, line 66 through column 3, line 4.

[7] Webster's Third New International Dictionary of the English Language Unabridged, Merriam-Webster, Inc., 2002.

[8] See U.S. Patent No. 6,481,179, column 2, lines 7-9, 18-23, and line 66 through column 3, line 4 for the disclosure relating to the insulation.

[9] Final Office Action dated December 22, 2004, page 2, paragraph 2.

[10] *Id.* at paragraph 5.

[11] M.P.E.P. § 2144.04 (E), citing *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2002).

Circuit reversed the Board's rejection of Applicants method claim directed to a method of processing trusted commands with a minimum of trusted software.[12] The Board found that "it is basic knowledge that communication in trusted environments is performed over trusted paths" and to do so is "nothing more than good common sense."[13] The Federal Circuit, in its reversal, found that the Boards assessment of basic knowledge and common sense lacked substantial evidence support since it was not based on any evidence in the record.[14] Like Zurko, there is no evidentiary support in Kennedy or Zen. Kennedy fails altogether to disclose or suggest a door with panels and a core, and Zen fails to discuss the weight and strength properties of the insulation and panels.

Thus, the Examiner fails to provide the "substantial evidence"[15] necessary to support his position that "common knowledge in the art" provided the motivation or suggestion to combine Kennedy and Zen. Accordingly, claim 1 is submitted as patentable over the combination of Kennedy and Zen since the Examiner failed to provide evidence to support his asserted motivation or suggestion to combine these references.

The rejection also improperly relies on Appellants' disclosure. Both of the cited references are devoid of any teachings directed to the objectives relied on by the Examiner (i.e., lightweight, strong, inexpensive) for providing motivation or suggestion to combine. Appellants' specification, however, discloses objectives for a mine door leaf that include "relatively lightweight for its size", "resistant to stresses",

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[12] *In re Zurko* at 1382.

[13] *Id.* at 1385.

[14] *Id.*

[15] *Id.* at 1381.

and "that can be economically fabricated" (page 1, lines 7-20). It is apparent that the Examiner has relied on the objectives disclosed by Appellant's in the obviousness rejection. The Federal Circuit has repeatedly warned that to imbue a skilled artisan with knowledge of an invention, when no reference of record conveys or suggests that knowledge, is to fall victim to the "insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."[16] The use of hindsight in selecting references for combination in a §103(a) rejection is forbidden.[17]

As a result, the obviousness rejection based on a combination of Kennedy and Zen is improper since the only motivation or suggestion to combine these references was taught by Appellant. Thus, claim 1 is also non-obvious and patentable over the references of record including Kennedy and Zen for these additional reasons.

Claims 2-9, 14 and 31-37 depend from amended claim 1 and are allowable for the same reasons as claim 1.

Furthermore, to the extent claim 1 includes the same recitations as claim 41, claim 1 is patentable for the same reasons discussed below with respect to claim 41.

B. Claims 2, 7, 33, 36

Claims 2 depends from claim 1 and recites that the force-transmitting relationship is established by **adhesion and mechanical coupling** of the core to the panels. An exemplary mechanical coupling is shown in Fig. 2 and described in page 6,

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[16] *W.L. Gore & Assoc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983).

[17] *In re Rouffet*, 149 F.3d 1350, 1358, 47 U.S.P.Q.2d 1453 (Fed. Cir. 1998).

lines 3-10 of the specification. To establish obviousness, every claim requirement must be taught or suggested by the prior art.[18] Neither Kennedy nor Zen teach mechanical coupling of the core to the panels.

As previously mentioned, Kennedy fails altogether to teach or suggest a mine leaf with outer panels and a core between the panels. Thus, Kennedy also fails to teach or suggest adhering and/or coupling the core to the panels.

Zen also does not teach a door leaf where a force-transmitting relationship is established by mechanical coupling of the core to the panels. The Office action also states that the diagonal members 12 are "for mechanical coupling of the core (4) to the panels."[19] However, the diagonal members 12 are in the jamb members 5 and therefore, at best, would act as a mechanical coupling between the jamb members and the core (Fig. 3) and not the panels and the core.[20] Nowhere does Zen disclose or suggest coupling the panels 3 to the core 4.

The Examiner also indicated that "[t]he insulation once dried, forms a mechanical coupling with the panels."[21] Appellant respectfully disagree. The Examiner is relying on an inherent teaching of Zen that the insulation would adhere to the panels. As is evident from the claim, Appellant have distinguished adhesive coupling from mechanical coupling. Zen fails to disclose any structure to facilitate mechanical coupling the insulation to the panel.

Both Kennedy and Zen fail to teach the mechanical coupling element of Appellant's claimed invention. Thus, the obviousness rejection must fail for this additional reason.

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[18] *In re Royka*, 180 U.S.P.Q. 580, 583 (C.C.P.A. 1974).

[19] Final Office Action, page 2, paragraph 2.

[20] U.S. Patent No. 6,481,179, column 2, lines 32-39.

[21] Final Office Action, pages 4-5, paragraph 5.

To the extent claims 7, 33, and 36 include the same recitations as claim 2, the claims are patentable for the same reasons as claim 2.

C. Claims 34 and 37

Claim 34 depends from claim 33 and recite that the mine door leaf further comprises a mechanical coupling device for mechanical coupling of the core to the panels. The mechanical coupling device comprises at least one of wire screen and rebar-type elements. As mentioned above with respect to claim 2, Zen neither teaches nor suggests mechanical coupling of the core to the panels. It follows that Zen cannot teach or suggest the use of either wire screen or rebar-type elements. Thus, claim 34 is patentable for this additional reason.

To the extent claim 37 includes the same recitations as claim 34, the claim is patentable for the same reasons as claim 34.

D. Claims 38-40

Claims 38-40 are directed to a mine door installation including a door leaf of generally laminar construction comprising a central core and outer panels. To the extent claims 38-40 include the same recitations as claims 1, 33, and 34, respectively, the claims are patentable for the same reasons discussed above with respect to claims 1, 33, and 34.

E. Claims 41-45

Claim 41 is directed to a mine door installation in a mine passageway of a mine, comprising:

a doorway frame in said mine passage, and

a door mounted on said doorway frame for swinging between open and closed positions,

said door including at least one door leaf, said door leaf comprising a central core of a solidified composition and outer panels on opposite faces of the core,

said door leaf having at least four edges, said frame directly supporting two of the edges when said door is in said closed position, another two of the edges being substantially free of direct support.

To the extent claim 41 includes the same recitations as claim 1, claim 41 is patentable for the same reasons discussed above with respect to claim 1.

Furthermore, claim 41 sets forth a mine door installation suitable for forces exerted on a door in a mine, such as the forces described in more detail above. An exemplary embodiment of claim 41 is shown in Fig. 1 of the present application. As illustrated, each of the door leafs 5L, 5R is mounted in the door frame 3 using hinge component 27, 29 for swinging between closed and open positions. In addition, each of the door leafs 5L, 5R is supported in its closed position by engagement with the frame 3 of the doorway. As a result, the door is substantially unsupported along its free vertical edge and along its lower edge. Supports along the free vertical edge and the lower edge of the door leaf are commonly undesirable in a mine since they restrict passage through the doorway, are susceptible to damage from mining equipment passing through the doorway, and are susceptible to damage caused by mine convergence. A mine door free of support along the lower and vertical edges allows for movement of the door during mine convergence thereby inhibiting damage to the doors. The door leaf of claim 41 is mounted in this cantilevered fashion, yet is strong enough to withstand use in a mine due to the central core. Claim 41 is also patentable over Kennedy and Zen because no reasonable expectation of success existed at the time the invention was made to modify the Kennedy

mine door with the Zen panels and insulation in the manner suggested by the Examiner to develop the door leaf recited in claim 41.

Kennedy discloses, as shown in Fig. 1, a mine door system having a door frame, a mine door hingedly mounted on the door frame, and a column contractible heightwise without loss of structural integrity to accommodate a convergence of the ceiling or floor of the passageway without any substantial deformation of the door frame. Thus, the Kennedy mine door system, including the doors, is extremely robust in order to withstand the elevated pressures and forces to which mine door systems are subjected.

Zen discloses a frame 2 for a steel clad door comprising a pair of jamb members 5, a header 6 and a sill 7 molded from a composite material. While not expressly stated, it is apparent that the steel clad door disclosed in Zen is for conventional uses (e.g., residential, commercial, industrial) and not for use in a mine. A door manufacture for such uses is subjected to far less stress and abuse then a door manufactured for use in a mine. As noted above, a door manufactured for use in a mine has to be capable of withstanding severe stresses associated with such use whereas a door manufactured for conventional uses does not.

While the Zen door frame is characterized as being "strong," "strong" needs to be taken in the context in which it is used. The Zen door frame is described as being stronger than a comparable wood frame.[22] A door frame manufactured to be "strong" as compared to a wood frame clearly does not suggest that the door is capable of withstanding the stresses of a mine.

The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success.[23] In this case, however, there is no

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[22] U.S. Patent No. 6,481,179, column 1, lines 16-33.

[23] M.P.E.P. §2143.02 citing *In re Merck & Co., Inc.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986).

reasonable expectation of success in modifying Kennedy in view of Zen to achieve the claimed invention. As discussed above, Zen's door is for conventional uses and Kennedy's door is for use in a mine, which is significantly different. The Kennedy door leafs are designed to withstand the stresses of the mine environment whereas there is no showing or suggestion that the Zen door could withstand such stresses. Thus, one having ordinary skill in the art would have no reasonable expectation that the Zen door could be used in the Kennedy door system and withstand the stresses of a mine as taught by Kennedy.

As a result, claim 41 and claims 42-45, which depend from claim 41, are further patentable over Kennedy in view of Zen for these additional reasons.

VIII. Conclusion

The rejections of the claims on appeal are in error for the reasons set forth above. Therefore, Appellant request that the Examiner's rejections of claims 1-9, 14, and 31-45 be reversed.

* Enclosed is a check in the amount of $250 for the appeal brief fee under 37 C.F.R. §41.20(b)(2). Any additional fee may be charged to Deposit Account No. 19-1345.

Respectfully submitted,

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APPENDIX A

PENDING CLAIMS ON APPEAL

1. (Previously presented) A mine door leaf of generally laminar construction mounted for swinging between open and closed positions in a doorway in a mine passage, said mine door leaf comprising a central core of a solidified composition, outer panels on opposite faces of the core, the core having a force-transmitting relationship with the panels constituting the panels and core as an integral stress-resistant structure resistant to stresses to which the door leaf is subjected in a mine, including torsion-induced stresses, shear and bending stresses, and stresses induced by its own weight, and one or more hinge components on the leaf.

2. (Previously presented) The mine door leaf as set forth in claim 1 wherein the force-transmitting relationship is established by adhesion and mechanical coupling of the core to the panels.

3. (Previously presented) The mine door leaf as set forth in claim 2 wherein the core comprises a fire-resistant foam material.

4. (Previously presented) The mine door leaf as set forth in claim 3 wherein the core comprises a fire-resistant polyurethane foam material adherent to the panels thereby establishing the force-transmitting relationship.

5. (Previously presented) The mine door leaf as set forth in claim 1 comprising a frame having a top, bottom and sides, the panels being secured on the frame in opposing spaced-apart relationship enclosing a space between the panels bounded by the top, bottom and sides of the frame, the core comprising a solidified filling in said space.

6. (Previously presented) The mine door leaf as set forth in claim 5 wherein said door panels are secured to the top, bottom and sides of the frame on opposite faces of the frame.

7. (Previously presented) The mine door leaf as set forth in claim 5 wherein the force-transmitting relationship is established by adhesion and mechanical coupling of the filling to the door panels.

8. (Previously presented) The mine door leaf as set forth in claim 7 wherein the filling is a fire-resistant foam material.

9. (Previously presented) The mine door leaf as set forth in claim 8 wherein the frame has one or more filling openings through which said filling was introduced in a fluent state.

10-13. Cancelled.

14. (Previously presented) The mine door leaf as set forth in claim 5 wherein the filling is a fire-resistant material having strength in tension and compression, and wherein the frame or one or more of the door panels has one or more filling openings through which said filling was introduced in a fluent state.

15-30. Cancelled.

31. (Previously presented) The mine door leaf as set forth in claim 1 wherein said mine door leaf is mounted on a doorway frame in said mine passage, said doorway frame comprising a column yieldable to accommodate mine convergence without permanent deformation of the doorway frame.

32. (Previously presented) The mine door leaf as set forth in claim 1 wherein the force-transmitting relationship is established by adhesion of the core to the panels.

33. (Previously presented) The mine door leaf as set forth in claim 1 wherein the force-transmitting relationship is established by mechanical coupling of the core to the panels.

34. (Previously presented) The mine door leaf as set forth in claim 33 further comprising a mechanical coupling device for mechanical coupling of the core to the panels, said mechanical coupling device comprising at least one of the following: wire screen; and rebar-type elements.

35. (Previously presented) The mine door leaf as set forth in claim 5 wherein the force-transmitting relationship is established by adhesion of the filling to the door panels.

36. (Previously presented) The mine door leaf as set forth in claim 5 wherein the force-transmitting relationship is established by mechanical coupling of the filling to the door panels.

37. (Previously presented) The mine door leaf as set forth in claim 36 further comprising a mechanical coupling device for mechanical coupling of the filling to the door panels, said mechanical coupling device comprising at least one of the following: wire screen; and rebar-type elements.

38. (Previously presented) A mine door installation in a mine passageway of a mine, comprising

a doorway frame in said mine passage, said doorway frame comprising a column yieldable to accommodate mine convergence without permanent deformation of the doorway frame;

a door leaf mounted on said doorway frame for swinging between open and closed positions;

said door leaf having a generally laminar construction comprising a central core of a solidified composition, and outer panels on opposite faces of the core, the core having a force-transmitting relationship with the panels constituting the panels and core as an integral stress-resistant structure resistant to stresses to which the door leaf is subjected in said mine, including torsion-induced stresses, shear and bending stresses, and stresses induced by its own weight.

39. (Previously presented) The mine door installation of claim 38 wherein the force-transmitting relationship is established by mechanical coupling of the core to the door panels.

40. (Previously presented) The mine door installation of claim 39 further comprising a mechanical coupling device for mechanical coupling of the core to the door panels, said mechanical coupling device comprising at least one of the following: wire screen; and rebar-type elements.

41. (Previously presented) A mine door installation in a mine passageway of a mine, comprising:

a doorway frame in said mine passage, and

a door mounted on said doorway frame for swinging between open and closed positions,

said door including at least one door leaf, said door leaf comprising a central core of a solidified composition and outer panels on opposite faces of the core,

said door leaf having at least four edges, said frame directly supporting two of the edges when said door is in said closed position, another two of the edges being substantially free of direct support.

42. (Previously presented) The mine door installation as set forth in claim 41 wherein the supported edges include an upper edge and a first vertical edge, and the free edges are a

lower edge and a second vertical edge opposite the first vertical edge.

43. (Previously presented) The mine door installation as set forth in claim 42 wherein the upper edge is supported by the doorway frame and the vertical edge is supported by at least one hinge mounted to the doorway frame.

44. (Previously presented) The mine door installation as set forth in claim 41 wherein said door includes two door leafs.

45. (Previously presented) The mine door installation as set forth in claim 41 further comprising at least one vertical column, said vertical column being adjustable to fit mine passages of different heights and yieldable to accommodate mine convergence without permanent deformation of said door frame.